Mumps

CLINICAL CASE DEFINITION

An illness with acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland, lasting ≥2 days, and without other apparent cause.

CASE CLASSIFICATION

Probable: A case that meets the clinical case definition, has noncontributory or no serologic or virologic testing, and is not epidemiologically linked to a confirmed or probable case.

Confirmed: A case that is laboratory confirmed or that meets the clinical case definition and is epidemiologically linked to a confirmed or probable case. A laboratory-confirmed case does not need to meet the clinical case definition.

Comment: Two probable cases that are epidemiologically linked would be considered confirmed, even in the absence of laboratory confirmation. False-positive IgM results by immunofluorescent antibody assays have been reported.

TRANSMISSION

Person to person via airborne transmission or direct contact with infected droplet nuclei or saliva.

REPORTING/INVESTIGATION

- Health care providers should **immediately** report cases/suspect cases of mumps to local health department serving the residence of the case.

- Local health department:
  - Contact case/guardian and health care provider
  - Determine if case meets clinical case definition;
  - If definition met (probable or confirmed cases), or otherwise suspected as mumps case, investigate using CDC surveillance worksheet and control guidelines below.

  - Notify MDCH Immunization Field Representative serving the case's residence. If Field Representative is unavailable, LHD should report case/suspect case to MDCH VPD Surveillance Coordinator 517/335-9567

or 517-335-8159.

- ❑ Note: In addition, the Local Health Department should enter the case to the Michigan Disease Surveillance System (MDSS). CDC Mumps Surveillance Worksheet may be helpful in field investigation to collect and capture data.
- ❑ As new information becomes available, enter to MDSS in a timely fashion.

- ♦ MDCH Immunization Field Representative will notify MDCH VPD Surveillance Coordinator.

- ♦ In the event of death, obtain and send copies of hospital discharge summary, death certificate, and autopsy report to MDCH Immunization Division.

LABORATORY CONFIRMATION

Lab confirmation of mumps cases is essential and should be attempted for all potential cases meeting the clinical case definition. Laboratory confirmation for mumps is defined as:

- ♦ Positive serologic test for mumps immunoglobulin M (IgM) antibody.

- ♦ Significant rise between acute-and convalescent-phase titers in serum mumps immunoglobulin G (IgG) antibody level by any standard serologic assay

    - ❑ Collection of sera for these paired assays should be appropriately spaced: 14 or more days (minimum 10 days) should separate the collection of the acute and convalescent sera

    - ❑ IgG paired sera should be tested in parallel (i.e., run together in the same test/assay batch)

    - ❑ Note: If the suspected case has received one or more doses of MMR, the IgM response may be missing, delayed, or transient; paired mumps IgG or a repeated mumps IgM should be considered in these instances.

- ♦ Isolation of mumps virus from an appropriate clinical specimen (e.g. buccal mucosal swabs, throat swabs, oral fluid; urine). For the mumps viral specimen a parotid gland/buccal swab is the preferred specimen. See additional information under LAB PROCEDURES AND CONSIDERATIONS, below.

Mumps testing is available through the MDCH laboratory but is subject to reagent availability.

Pre-approval arrangements must be made through the MDCH VPD Surveillance Coordinator at 517/335-9567 or 517-335-8159. Serologic testing for mumps is also available through many commercial clinical laboratories.

IMMUNITY/SUSCEPTIBILITY

Individuals should be considered immune (protected against) mumps only if they meet one or more of the following conditions:

- born before 1957
- have documentation of a history of physician-diagnosed mumps
- serologic evidence of immunity to mumps
- documentation of receipt of at least 1 dose mumps-containing vaccine on or after age 12 months. NOTE: Two doses of mumps vaccine, as combination MMR, separated by at least 4 weeks, are routinely recommended for all children. Michigan school entry immunization rules require 2 doses of measles, mumps, and rubella vaccine

CONTROL MEASURES

- Investigate reports of suspected mumps **immediately**.

- Physician-diagnosed cases meeting the clinical case definition (above) should be regarded as a probable case.

- Enhance surveillance in the affected setting and community.

- Exclude cases or suspected cases from group activity settings (e.g. schools, day-care centers, work places, camps) until 9 days after onset of parotitis, or until ruled-out by physician or serologic testing. Instruct cases/suspect cases to avoid exposing other persons, especially persons or groups thought to be susceptible to mumps. In health care settings, use of Droplet Precautions is recommended.

- Persons exposed to the case in group-activity settings (e.g. schools, day-care centers, work place, camps) who cannot readily provide documentation of mumps immunity should be vaccinated or excluded from the setting;

    - Exclusion should continue until 25 days after the onset of parotitis in the last person with mumps in the affected setting/institution.
    - Once vaccinated, persons may be re-admitted to the activity setting/institution.
    - Mumps vaccine, preferably as MMR, should be administered to susceptible

persons.

- Although mumps vaccination has not been shown to be effective in preventing mumps in persons already infected, it will prevent infection resulting from subsequent exposure.
- Susceptible persons vaccinated early in the course of an outbreak may be protected. However, cases are expected to continue to occur among newly vaccinated persons who are already infected for at least 3 weeks following vaccination because of the long incubation period for mumps.

♦ Based on data showing 2 doses of mumps (MMR) vaccine is more effective than one dose for preventing mumps, in outbreaks a 2nd dose of MMR is recommended for the following groups:
  - Health care workers
  - School-aged children
  - Students at post-high school educational institutions
  - Other age groups considered at high risk of exposure

LABORATORY PROCEDURES AND CONSIDERATIONS

Cases of mumps should be confirmed by laboratory methods. Currently MDCH lab offers IgG serologic testing; this requires paired serum specimens collected from the acute- and convalescent-phases of illness. An investigational (not FDA approved) mumps IgM serology is also available at CDC labs through MDCH. Pre-approval arrangements must be made through the MDCH VPD Surveillance Coordinator at 517/335-9567 or 517-335-8159.

Commercial mumps IgM tests are available at private clinical labs.

In addition to serology, virologic methods are becoming available to further study and characterize the molecular epidemiology of circulating mumps virus strains. If possible, collect clinical specimens for such virologic studies. However, **isolation of mumps virus is not recommended as a routine method to diagnose and confirm mumps.** Serology is the appropriate method for confirming mumps.

MUMPS SEROLOGY

Purpose: to confirm a case of mumps.

Specimen needed: serum, 2 ml.

MDCH lab kit: unit 8

Specimen container: plastic serum tube with skirted cap

MDCH lab form: DCH-0583 (formerly FB 200)

Specimen collection/submission procedure:

- Collect at least 5 mL of whole blood in red-top or other tube without anticoagulant. Separate serum from blood by centrifugation and pour into PLASTIC serum tube, store at 2 - 8°C, or freeze serum if it cannot be shipped and received in lab within 3 days. Do not freeze whole blood.

- Timing of specimen collection
  - **For IgM testing**: collect serum between the onset of mumps illness and 30 days after.
  - **For paired IgG testing**:
    - acute-phase specimen - collect as soon after mumps illness onset as possible;
    - convalescent-phase specimen - collect 10-21 days (no earlier than 10 days) after collecting acute-phase specimen.

    Test will be done when both specimens are received (specimens can be sent individually or acute can be held at 2 - 8°C and sent to lab with convalescent specimen). If the specimens are sent to MDCH lab separately, be sure to indicate on the Lab Request form that this is an acute serum and that the convalescent specimen will follow in approximately 10 -14 days.

- Label tube with patient name, date of birth, and date of specimen collection.

- Complete MDCH Virology Test Requisition (form DCH-0583, formerly FB 200)); complete all information in the Patient Information and Specimen Information sections.

- Be sure MDCH Immunization Division has been notified of the case investigation.

- Ship specimens on a cold pack by overnight delivery if possible.

- Mail specimens to:

  MDCH Viral Serology
  3350 North ML King Blvd. Bldg 44 Room 155
  PO Box 30035
  Lansing, MI 48909-7535

MUMPS VIROLOGY/MOLECULAR EPIDEMIOLOGY STUDIES

Purpose:

To help determine the geographic origin of the virus and the viral strains circulating in the U.S. Virus isolates are important for molecular epidemiologic surveillance

Isolation of mumps virus is not recommended as a routine method to diagnose and confirm mumps.

Specimens:

Buccal mucosal swabs (preferred); alternates are throat swabs, oral fluid; urine, cerebral-spinal fluid (CSF).

Specimen collection/submission procedure:

- Label all specimen containers used with patient name, date of birth, and date of specimen collection.

- **Respiratory specimens – collect buccal or throat swab up to 9 days after symptom onset**

  - Buccal mucosa swab preferred. Massage parotid area for 30 seconds prior to swabbing the buccal mucosa, then swab the space between the inside of cheek and the upper molar teeth. The parotid duct (Stensen's duct) drains in this space near the upper rear molars.).
  - Throat (oropharyngeal) or nasopharyngeal swabs are an alternative.
  - Place swab in a tube containing 2-3 mls of viral transport medium or other sterile isotonic solution (phosphate buffered saline or cell culture medium). Leave swab in tube (cut or break off swab stem and tighten tube cap).
  - Send specimens on cold pack via overnight courier to MDCH lab.

- **Urine specimens – can be collected up to 9 days (maximum 14 days) after onset.**

  - Collect 50-100 ml of urine in a sterile urine specimen container; first morning void is preferable, collect urine "clean catch mid-stream."
  - Keep cold (4º C); Upon receipt at a facility equipped to centrifuge the sample, the urine is centrifuged at 4C for 10 minutes at 400 x g, recovering the sediment in 2-3 ml of sterile cell culture fluid or VTM. The urine sediment can be frozen at -70C or held at 4C until shipment. Ship specimens using ice packs or dry ice. Avoid freeze-thaw cycles.
  - If centrifugation is not available, do not freeze the urine sample. The entire urine specimen should be stored at 4°C and shipped to the lab on a cold pack.

- Complete a MDCH Virology Test Requisition (form DCH-0583, formerly FB 200) for each specimen submitted; complete all information in the Patient Information and Specimen Information sections. Check "mumps" in the "Viral/Chlamydia Isolation" section. Mail specimens to:

  MDCH Virology
  3350 N ML King Blvd. Bldg 44 Room 155
  PO Box 30035
  Lansing, MI 48909-7535

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